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Impact of scribes on emergency department patient throughput one year after implementation☆,☆☆,★

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ABSTRACT

Objectives: Assess the impact of scribes on an academic emergency department's (ED) throughput one year after implementation.
Methods: A prospective cohort design compared throughput metrics of patients managed when scribes were and were not a part of the treatment team during pre-defined study hours in a tertiary academic ED with both an adult and pediatric ED. An alternating-day pattern one year following scribe implementation ensured balance between the scribe and non-scribe groups in time of day, day of week, and patient complexity.
Results: Adult: Overall length of stay (LOS) was essentially the same in both groups (214 vs. 215 min, $p = 0.34$). In area A where staffing includes an attending and residents, scribes made a significant impact in treatment room time in the afternoon (190 vs 179 min, $p = 0.021$) with an increase in patients seen per hour on scribed days (2.00 vs. 2.13). There was no statistically significant changes in throughput metrics in area B staffed by an attending and a nurse practitioner/physician assistant, however scribed days did average more patients per hour (2.01 vs. 2.14).
Pediatric: All throughput measurements were significantly longer when the treatment team had a scribe; however, patients per hour increased from 2.33 to 2.49 on scribed days.
Conclusions: Overall patient throughput was not enhanced by scribes. Certain areas and staffing combinations yielded improvements in treatment room and door to provider time, however, scribes appear to have enabled attending physicians to see more patients per hour. This effect varied across treatment areas and times of day.

1. Introduction

1.1. Background

Clerical burden, including electronic health record (EHR) documentation, reviewing past medical records, and ordering tests and medications, has become a significant burden on Emergency Medicine (EM) providers [1]. Tasks involving a computer interface can take up more than half of a physician's time per shift and are often felt to represent clerical burdens [2]. One proposed solution to offset provider clerical burden is the use of scribes. Several editorials propose scribes as an operational tool for providers in a variety of health care settings [3-6], however, rigorous peer-reviewed literature is limited [7-15]. Furthermore, peer-review studies looking at the use of scribes in an emergency department (ED) are even more limited [9-15].

1.2. Importance

A recent meta-analysis highlighted the difficulty in determining how and when scribes are beneficial to EDs. By including available abstracts and peer reviewed manuscripts, the authors concluded that literature fails to show a difference in length of stay or time to disposition, but may suggest a small increase in the number of patients per hour seen when using scribes [16].

The impact of the scribe role must be critically examined to inform health administrators and physicians considering employing scribes and developing scribe programs. Additional research in this field may assist health economics researchers in the area of task substitution and productivity for medical practitioners.

1.3. Goals of this Investigation

Previously published work by our group showed that scribes failed to benefit patient throughput in the first few months following

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implementation of a scribe program at our academic medical center [15]. This follow-up study aims to further characterize the impact of scribes on throughput in an academic emergency department one year after scribe program implementation.

2. Methods

2.1. Study Design and Setting

The study was conducted in an academic ED which hosts an EM residency training program. Our ED has an attached pediatric ED and manages 73 000 patient visits annually, 82% of whom are adults (age > 17). Thirty-five percent of adult patients and 13% of pediatric patients are admitted. We have no "fast track" area given our minimal volume of low acuity patients. Our study utilized a prospective cohort design. The study was deemed exempt by our Institutional Review Board.

2.2. Selection of Participants

We evaluated all patients roomed during the study period from February 1, 2016 through April 30, 2016 (one year after the implementation of our scribe program), with the following predefined exceptions: behavioral health patients (due to excessive boarding and predictably long LOS in our population, potentially skewing throughput data), patients who left without being seen, and nurse-only visits (since these visits are not staffed by licensed providers). Fig. 1 illustrates our selection process.

For the study period, we divided ED patients into two groups: (1) patients managed by a "traditional" care team (without a medical scribe), where providers used personal preference to construct their own documentation in the medical record through transcription, voice recognition software, or self-entry in the EHR; and (2) patients managed by a team that included a medical scribe who documented for the attending physician. Scribes were assigned to attending physicians in three areas of the emergency department:

1. Treatment Area A: high-acuity area of the adult ED, open 24 h a day, where the team includes an attending physician, a senior EM resident and an intern;
2. Treatment Area B: a high acuity area of the adult ED open 8 h in the afternoon daily except on Mondays (open 16 h) staffed with an attending physician and a nurse practitioner (NP) or physician assistant (PA) (who staff high acuity patients with the attending physician and manage low acuity patients independently);
3. Pediatric ED staffed with an attending physician and 2–3 residents during evening shifts.

Scribe staffing followed an allocation pattern developed independently from the providers' schedules, with no preference given based to specific providers. The pattern ensured balance between the scribe and non-scribe groups in the times and days of the week, with an equal number of scribe days and non-scribed days in this study.

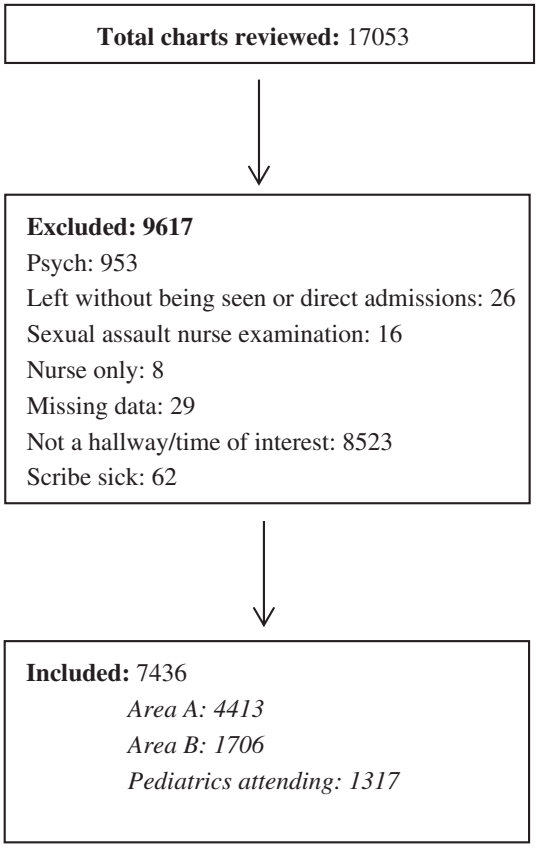

Fig. 1. Process of chart selection.

2.3. Intervention

Scribes were recruited and trained through an in-house program with a defined curriculum developed by a physician with prior experience implementing scribe programs [17]. The scribes were largely pre-health students hired as temporary employees for expected one- to two-year periods. Training began in February 2015. Each scribe provided 1-to-1 support to an attending physician for the entirety of the physician's shift.

We developed an allocation scheme to allow for accurate comparison between intervention (scribe) and control (non-scribed) patients. The scheme was followed without deviation throughout the study period. Patients seen during shift A with a scribe were compared to patients seen during shift A without a scribe, and so on.

2.4. Methods and Measurements

Investigators extracted patient demographics, patient-specific timestamps and type of provider (attending, resident, NP/PA) from the EHR. We evaluated patient-specific throughput metrics for each visit during the study period. Discrete fields in the EHR allowed us to identify all patients for whom a scribe was part of the care team.

In treatment areas where more than one shift was covered by a scribe in a 24 h period, patients were further categorized by shift time (morning (7a-3p), afternoon (3p-11p), overnight (11p-7a)).

2.5. Outcomes

Measures analyzed for both the scribe and non-scribed groups included:

1. Length of stay (minutes): arrival time until departure from the department
2. Door to provider (minutes): arrival time until first seen by a provider
3. Treatment room time (minutes): total time spent in the treatment room (equals total ED LOS minus any time spent in the waiting room)
4. Provider to disposition (minutes): time first seen by a provider until the disposition decision was made and entered in the EHR

2.6. Analysis

Continuous features were summarized with medians. Categorical features were summarized with frequency counts and percentages. Comparisons between the scribe group and non-scribed group were evaluated using Wilcoxon rank sum or chi-square tests. Statistical

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